VERTICAL DEVICE $4F^2$ EEPROM MEMORY

Related Application

[0001] This application is related to U.S. Application Serial No. (Attorney Docket No. 400.264US01) filed 2/24/04, 200_, entitled "$4F^2$ EEPROM NROM MEMORY ARRAYS WITH VERTICAL DEVICES," which is commonly assigned.

Technical Field of the Invention

[0002] The present invention relates generally to integrated circuits and in particular the present invention relates to EEPROM memory devices.

Background of the Invention

[0003] Memory devices are typically provided as internal storage areas in the computer. The term memory identifies data storage that comes in the form of integrated circuit chips. There are several different types of memory used in modern electronics, one common type is RAM (random-access memory). RAM is characteristically found in use as main memory in a computer environment. RAM refers to read and write memory; that is, you can both write data into RAM and read data from RAM. This is in contrast to read-only memory (ROM), which permits you only to read data. Most RAM is volatile, which means that it requires a steady flow of electricity to maintain its contents. As soon as the power is turned off, whatever data was in RAM is lost.

[0004] Computers almost always contain a small amount of ROM that holds instructions for starting up the computer. Unlike RAM, ROM cannot be written to. An EEPROM (electrically erasable programmable read-only memory) is a special type non-volatile ROM that can be erased by exposing it to an electrical charge. EEPROM comprise a memory array which includes a large number of memory cells having electrically isolated gates (floating gates). Data is stored in the memory cells in the form of charge on the floating gates. Each of the cells within an EEPROM memory array can be electrically programmed in a random basis by charging the floating gate. The charge can also be randomly removed from the floating gate by an erase operation.